CLAIMS

What is claimed is:

1.   A system for data packet marking, the system comprising:

a first memory element for storing a plurality of first packet quality of service

5   indicators, a first packet quality of service field, and a second packet quality of service field;

a second memory element for storing a plurality of second packet quality of service indicators; and

a processor, operatively coupled to the first and second memory elements, for

10   receiving one or more quality of service commands, wherein the one or more service commands include a plurality of third packet quality of service indicators,

wherein the processor uses an index to search the second memory element, the search returns a subset of the plurality of second packet quality of service indicators,

wherein the index is the first packet quality of service field or the second

15   packet quality of service field,

wherein the processor creates a modified data packet by determining which of the packet quality of service fields to insert in the data packet, wherein the determination is based on the one or more quality of service commands.

2.   The data packet marking system of claim 1, where the plurality of first

20   packet quality of service indicators includes a first VPRI field, a first EXP field, and a first IPToS field.

3.   The data packet marking system of claim 1, where the first packet quality of service field is a mark select field.

4.   The data packet marking system of claim 1, where the second packet

25   quality of service field is a queue number.

5.   The data packet marking system of claim 1, where the first packet quality of service field is generated by receive components of a data packet distribution system.

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6. The data packet marking system of claim 1, where the first packet quality of service field includes a three bit select field.

7. The data packet marking system of claim 1, where the first packet quality of service field is generated by receive components of a data packet distribution system and is passed to transmit components of the data packet distribution system after the first packet quality of service field is returned from an internal network.

8. The data packet marking system of claim 1, where the first packet quality of service field is provided by a memory element associated with receive components, where addresses for the memory element are configured to correspond to the result of a search of a content addressable memory element, and where the search of the content addressable memory element search is based on the structure of an incoming data packet.

9. The data packet marking system of claim 1, where the first packet quality of service field is provided by a virtual local area network state table.

10. The data packet marking system of claim 1, where the first packet quality of service field is provided by a port state table.

11. The data packet marking system of claim 1, where the first packet quality of service field is generate by a plurality of memory elements associated with receive components, and the determination of which of the plurality of memory elements provides the first packet quality of service field is based on a priority associated with potential first packet quality of service field in the plurality of memory elements, where the priority is based on PST, VST, 802.1p, MPLS and IPToS values.

12. The data packet marking system of claim 1, where the first packet quality of service field three quality of service indicators.

13. The data packet marking system of claim 1, where the first packet quality of service field consists of three bits.

14. The data packet marking system of claim 1, where the second packet quality of service field is a queue number generated by a distributor, where the distributor houses a data packet receiver and a data packet transmitter.

15. The data packet marking system of claim 1, where the one or more quality service commands are included in a transmission modification recipe.

16. The data packet marking system of claim 1, where the one or more quality service commands includes an instruction regarding which of a plurality of VPRI fields in the data packet should be modified.

17. The data packet marking system of claim 1, where the one or more quality service commands includes an instruction regarding which of a plurality of EXP fields in the data packet should be modified.

18. The data packet marking system of claim 1, where the one or more quality service commands includes an instruction regarding which of a plurality of IPToS fields in the data packet should be modified.

19. The data packet marking system of claim 1, where the one or more quality service commands instructs the processor to use quality of service fields from the first memory element unless the search of the second memory element returns quality of service fields, where the index is the queue number.

20. The data packet marking system of claim 1, where the one or more quality service commands instructs the processor to use quality of service fields from the first memory element unless the search of the second memory element returns quality of service fields, where the index is the egress mark set.

21. The data packet marking system of claim 1, where the one or more quality service commands includes an instruction to select a parser generated page, where the selection of the parser generated page is based on a virtual LAN service.

22. A method of processing a packet comprising:

providing a multi-dimensional quality of service indicator for a packet; and

selectively modifying one or more quality of service fields within the packet, or a packet derived there-from, responsive to at least a portion of the multi-dimensional quality of service indicator.

23. The method of claim 22 wherein the multi-dimensional quality of service indicator comprises an ingress quality of service indicator, an egress quality of service indicator, and packet marking control information, and the selective modifying step comprises selectively modifying one or more quality of service fields within the packet responsive to the packet marking control information.

24. The method of claim 23 wherein the multi-dimensional quality of service indicator further comprises a host quality of service indicator.

25. The method of claim 23 further comprising utilizing the ingress quality of service indicator as an ingress queue select.

26. The method of claim 23 further comprising utilizing the egress quality of service indicator as an egress queue select.

27. The method of claim 23 further comprising utilizing the host quality of service indicator as an ingress queue select for a host.

28. A system for data packet marking, where the data packet may include a plurality of packet structures including one or more VLAN packets, one or more MPLS packets, and one or more IP packets, where the outermost VLAN packet may include a first VPRI field, the outermost MPLS packet may include a first EXP field, and the outermost IP packet may include a first IPToS field, where the data packet may include a *mark set*, where the mark set may include a mark select field, where the data packet may include a *queue number*, the data packet marking system comprising:

a first memory element, where the first memory element is configured to receive the mark set, the queue number, the first VPRI field, the first EXP field, and the first IPToS field;

a second memory element, where the second memory element is configured to hold one or more second VPRI fields, one or more second EXP fields, and one or more second IPToS fields;

a processor, where the processor is configured to receive one or more *mark commands*, where the processor is configured to receive a third VPRI field, a third EXP field, and a third IPToS field,

where the processor is configured to use an index to search the second memory element, where the search is configured to return one of the second VPRI fields, one of the second EXP fields, and one of the second IPToS fields, where the index may be the queue number, where the index may be the mark select field,

where the processor is configured to create a modified data packet by determining which one of the VPRI fields, which one of the EXP fields, and which one of the IPToS fields to insert in the data packet, where the determination is based on one of the mark commands.

29. The data packet marking system of claim 28, where the mark set is generated by receive components of a data packet distribution system.

30. The data packet marking system of claim 28, where the mark set includes a three bit select field and a three bit mask field.

31. The data packet marking system of claim 28, where the mark set is generated by receive components of a data packet distribution system and is passed to transmit components of the data packet distribution system after the egress mark set is returned from an internal network.

32. The data packet marking system of claim 28, where the mark set is provided by a memory element associated with receive components, where addresses for the memory element are configured to correspond to the result of a search of a content addressable memory element, and where the search of the content addressable memory element search is based on the structure of an incoming data packet.

33. The data packet marking system of claim 28, where the mark set is provided by a virtual local area network state table.

34. The data packet marking system of claim 28, where the mark set is provided by a port state table.

35.   The data packet marking system of claim 28, where the mark set is generate by a plurality of memory elements associated with receive components, and the determination of which of the plurality of memory elements provides the mark set is based on a priority associated with potential mark sets in the plurality of memory elements, where the priority is based on PST, VST, 802.1p, MPLS and IPToS values.

36.   The data packet marking system of claim 28, where the mark set includes three quality of service masks and the mark select field includes three quality of service indicators.

37.   The data packet marking system of claim 28, where the mark set consists of six bits.

38.   The data packet marking system of claim 28, where the mark set consists of six bits, where three bits provide three quality of service masks.

39.   The data packet marking system of claim 28, where the mark set consists of six bits, where three bits provide the mark select field.

40.   The data packet marking system of claim 28, where the mark set consists of six bits, where three bits provide three quality of service masks, and the first quality of service mask provides masking for a quality of service for VPRI packet data.

41.   The data packet marking system of claim 28, where the mark set consists of six bits, where three bits provide three quality of service masks, and the first quality of service mask provides masking for a quality of service for EXP packet data.

42.   The data packet marking system of claim 28, where the mark set consists of six bits, where three bits provide three quality of service masks, and the first quality of service mask provides masking for a quality of service for IPToS packet data.

43. The data packet marking system of claim 28, where the queue number is generated by a distributor, where the distributor houses a data packet receiver and a data packet transmitter.

44. The data packet marking system of claim 28, where the mark command is included in a transmission modification recipe.

45. The data packet marking system of claim 28, where the mark command includes an instruction regarding which of a plurality of VPRI fields in the data packet should be modified.

46. The data packet marking system of claim 28, where the mark command includes an instruction regarding which of a plurality of EXP fields in the data packet should be modified.

47. The data packet marking system of claim 28, where the mark command includes an instruction regarding which of a plurality of IPToS fields in the data packet should be modified.

48. The data packet marking system of claim 28, where the mark command instructs the processor to use quality of service fields from the first memory element unless the search of the second memory element returns quality of service fields, where the index is the queue number.

49. The data packet marking system of claim 28, where the mark command instructs the processor to use quality of service fields from the first memory element unless the search of the second memory element returns quality of service fields, where the index is the egress mark set.

50. The data packet marking system of claim 28, where the mark set includes a mask field configured to mask the mark select field, and the index is the masked mark select field, where the modified data packet includes quality of service fields from the second memory element.

51. The packet marking system of claim 28, where the mark set includes a mask field configured to mask the mark select field, and the index is the unmasked

egress mark select field, and where the modified data packet includes quality of service fields from the second memory element.

52.   The data packet marking system of claim 28, where the mark set includes a mask field configured to mask the mark select field, and the index is the masked egress mark select field, and where the modified data packet includes the quality of service fields from the first memory element unless the third quality of service fields includes replacement fields.

53.   The data packet marking system of claim 28, where the egress mark set includes a mask field configured to mask the mark select field, and the index is the unmasked mark select field, and where the modified data packet includes the first quality of service fields unless the third quality of service fields include replacement fields.

54.   The data packet marking system of claim 28, where the mark command includes an instruction to select a parser generated page, where the selection of the parser generated page is based on a virtual LAN service.

55.   A system for data packet marking, the system comprising:

a first memory element, where the first memory element is configured to receive a plurality of first packet quality of service indicators, a first packet quality of service field, and a second packet quality of service field;

a second memory element, where the second memory element is configured to hold a plurality of second packet quality of service indicators;

a processor, where the processor is configured to receive one or more quality of service commands, where the one or more quality of service commands includes a plurality of third packet quality of service indicators,

where the processor is configured to use an index to search the second memory element, where the search is configured to return a subset of the plurality of second packet quality of service indicators,

where the index may be the first packet quality of service field, where the index may be the second packet quality of service field,

where the processor is configured to create a modified data packet by determining which the packet quality of service fields to insert in the data packet, where the determination is based on the one or more quality of service commands.

56.   The data packet marking system of claim 55, where the plurality of first packet quality of service indicators includes a first VPRI field, a first EXP field, and a first IPToS field.

57.   The data packet marking system of claim 55, where the first packet quality of service field is a mark select field.

58.   The data packet marking system of claim 55, where the second packet quality of service field is a queue number.

59.   The data package marking system of claim 55, where the one or more quality of service commands are programmably generated based on the incoming data package and the status of transmit components that generate the commands.